

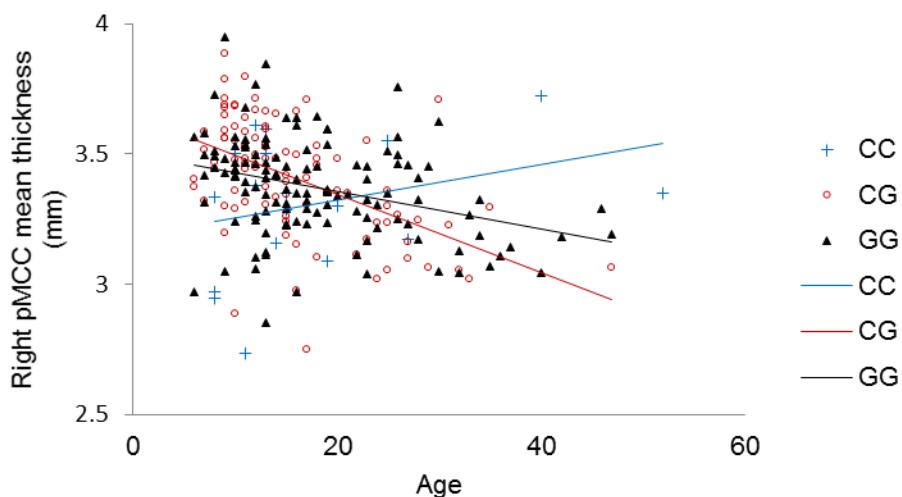
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Supplementary Figure S1. The brain regions which cortical thickness shows significant association with rs6950765 genotype: (a) Right middle-posterior part of the cingulate gyrus and sulcus (pMCC); (b) Right orbital gyri; (c) Right superior segment of the circular sulcus of the insula; (d) Right triangular part of the inferior frontal gyrus; (e) Right superior temporal sulcus (parallel sulcus)

(a) Right middle-posterior part of the cingulate gyrus and sulcus (pMCC)

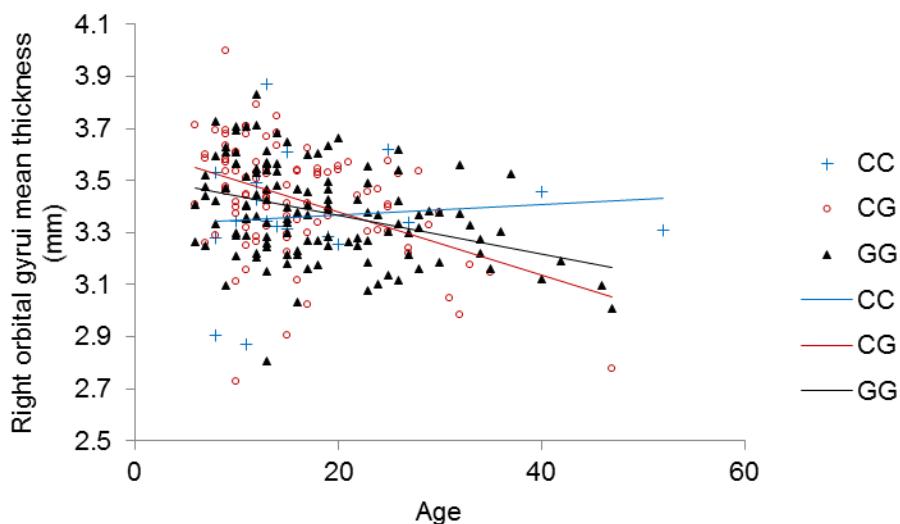


(b) Right orbital gyri

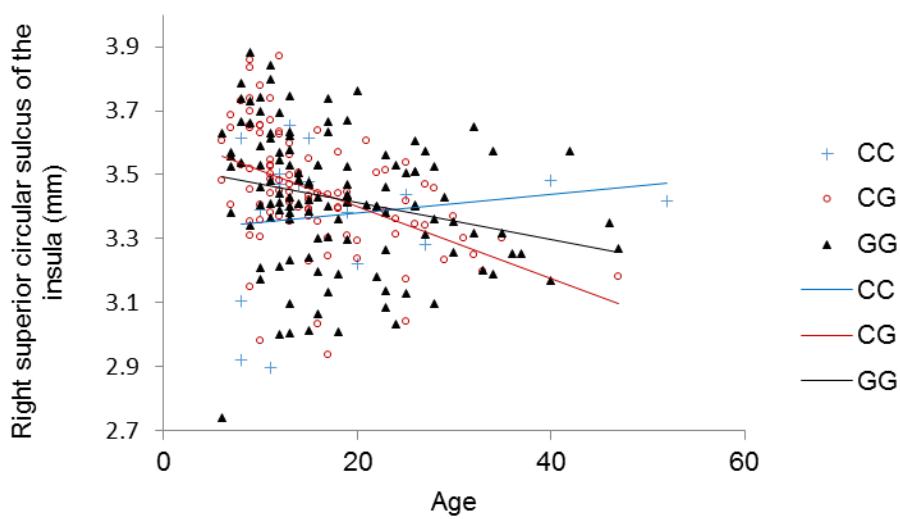
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(c) Right superior segment of the circular sulcus of the insula



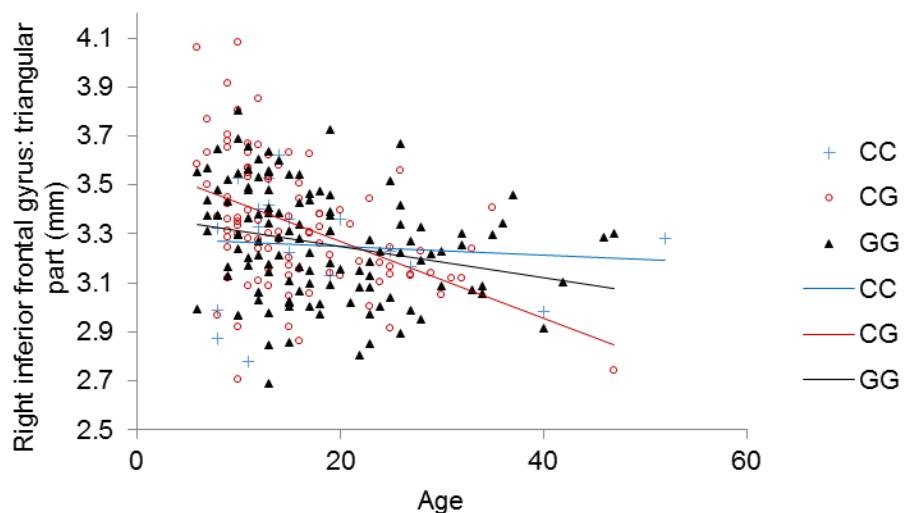
(d) Right triangular part of the inferior frontal gyrus

Appendix 1 to Chien YL, Chen YC, Chiu YN, et al. A translational exploration of the effects of *WNT2* variants on altered cortical structures in autism spectrum disorder. *J Psychiatry Neurosci* 2021. doi: 10.1503/jpn.210022

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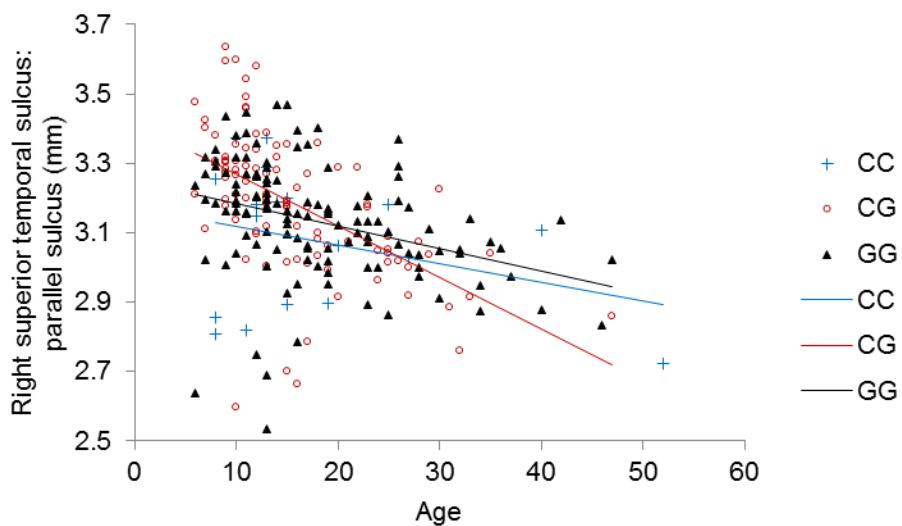


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(e) Right superior temporal sulcus (parallel sulcus)



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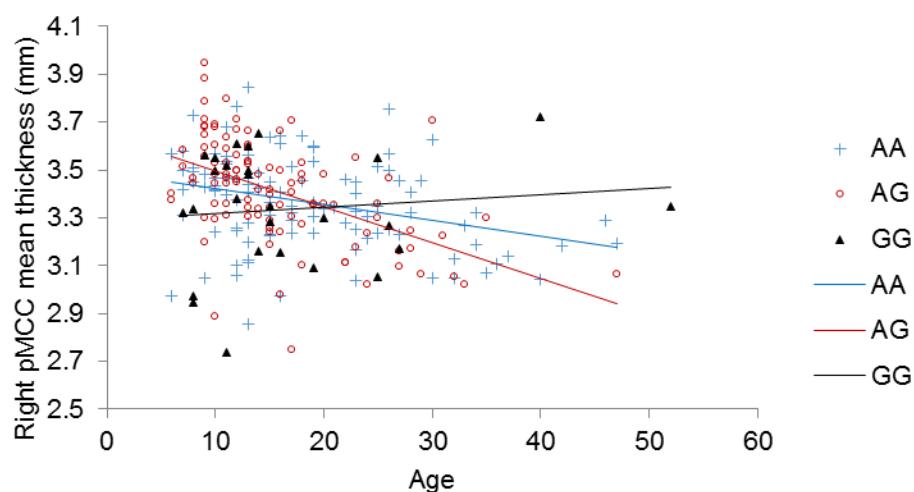
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Supplementary Figure S2. The brain regions which cortical thickness shows significant association with rs2896218: (a) Right middle-posterior part of the cingulate gyrus and sulcus (pMCC); (b) Right orbital gyri; (c) Right superior temporal sulcus (parallel sulcus)

(a) Right middle-posterior part of the cingulate gyrus and sulcus (pMCC)



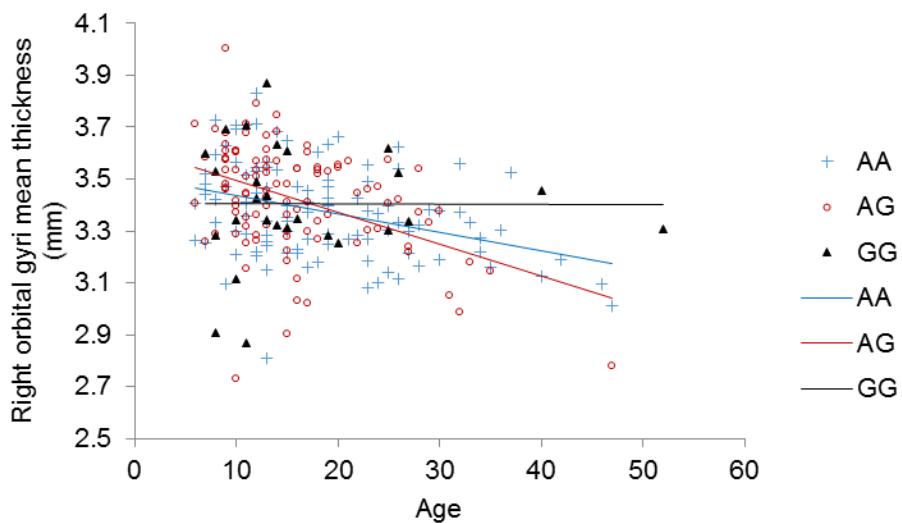
(b) Right orbital gyri

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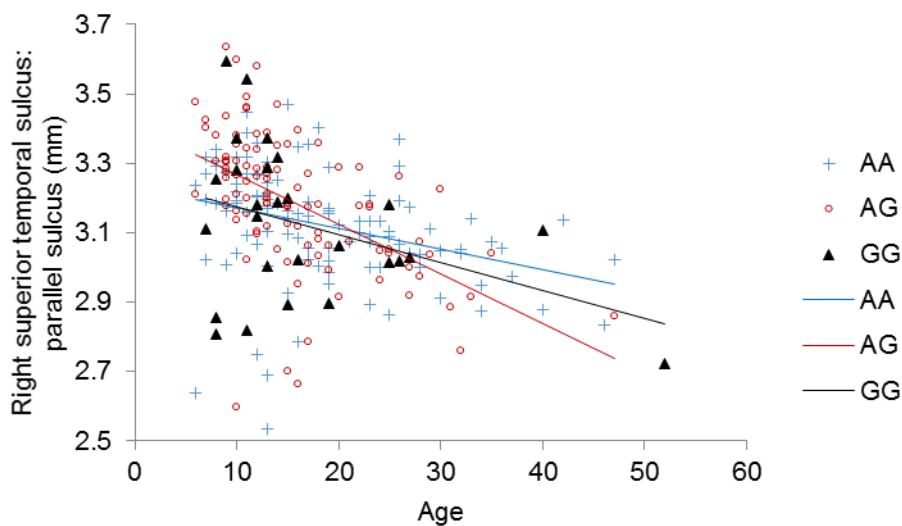
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(c) Right superior temporal sulcus (parallel sulcus)



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Supplementary Table S1. Demographics and cortical thickness of the whole sample

	TDC (N=121)		ASD (N=117)		F or χ^2	p
	Mean	SD or (%)	Mean	SD or (%)		
Age (range)	21.033 (7-52)	9.716	13.112 (6-28)	4.664	63.14	<.0001
Full-scale IQ	112.592	11.297	99.983	20.147	35.54	<.0001
Male	75	(61.98)	112	(95.73%)	$\chi^2=40.23$	<.0001
Left handedness	116	(98.87%)	108	(92.31%)	$\chi^2=1.36$	0.243
Global cortical thickness (mm)					t	p
Right hemisphere	3.086	0.126	3.100	0.165	-2.93	0.004
Left hemisphere	3.090	0.129	0.108	0.164	-2.87	0.005
Regional cortical thickness (mm)					t	p
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	3.389	0.206	3.373	0.213	-3.89	0.000
Right posterior transverse collateral sulcus	2.764	0.260	2.735	0.279	-3.15	0.002
Right <i>orbital gyri</i>	3.412	0.186	3.387	0.211	-3.63	0.000
Right superior segment of the <i>circular sulcus of the insula</i>	3.435	0.173	3.426	0.221	-3.09	0.002
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	3.215	0.197	3.182	0.236	-3.22	0.002
Right <i>triangular part of the inferior frontal gyrus</i>	3.292	0.216	3.288	0.270	-2.38	0.018
Right <i>superior temporal sulcus</i> (parallel sulcus)	3.145	0.170	3.154	0.203	-2.91	0.004
Right <i>orbital part of the inferior frontal gyrus</i>	3.419	0.265	3.398	0.306	-2.49	0.014
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	3.463	0.180	3.421	0.228	-3.28	0.001
						0.003

Note. Cortical thickness was compared by generalized linear model, covarying sex, age, full-scale IQ, handedness, and intracranial volumes

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Supplementary Table S2. Left hemisphere cortical regions that show significantly reduced thickness in two-stage sharpened method ($p < 0.05$) but not in classical one-stage method

GLM (sex age FIQ hand)	TDC (N=51)		ASD (N=88)		p	Classical	Two-stage
	Mean	SD	Mean	SD		one-stage	sharpened
Left precuneus (medial part of P1)	3.254	0.193	3.164	0.250	0.002	0.069	0.035
Left superior occipital sulcus and transverse occipital sulcus	2.834	0.193	2.739	0.237	0.003	0.069	0.035
Left superior parietal lobule (lateral part of P1)	2.933	0.187	2.873	0.222	0.004	0.069	0.035
Left middle-posterior part of the cingulate gyrus and sulcus (pMCC)	3.457	0.178	3.372	0.244	0.004	0.069	0.035

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Supplementary Table S3. Comparison of genotype frequency between ASD and TDC

	Dominant model	Recessive model	Over-dominant model	Overall
rs2285545	AA (n=89) vs. AC + CC (n=149)	AA + AC(n=192) vs. CC (n=49)	AC (n=103) vs. AA+CC (n=135)	AA (n=89) vs. AC (n=103) vs. CC (n=49)
chi-square	1.978	0.016	2.174	2.484
p-values	0.160	0.899	0.140	0.289
Hypothesised OR	1.3	1.03	1.3	
Bayes factor	1.15	1	1.21	
	Dominant model	Recessive model	Over-dominant model	Overall
rs2896218	AA (n=107) vs. AG+GG (n=131)	AA+AG (n=211) vs. GG (n=27)	AG (n=104) vs. AA+GG (n=134)	AA (n=107) vs. AG (n=104) vs. GG (n=27)
chi-square	0.881	0.499	0.240	1.062
p-values	0.348	0.480	0.624	0.588
Hypothesised OR	1.07	1.06	1.03	
Bayes factor	1	1	1	
	Dominant model	Recessive model	Over-dominant model	Overall
rs6950765	GG (n=123) vs. GC +CC (n=115)	GG +GC (n=220) vs. CC (n=18)	GC (n=97) vs. GG + CC (n=141)	GG (n=123) vs. GC (n=97) vs. CC (n=18)
chi-square	0.809	0.319	0.373	0.907
p-values	0.368	0.572	0.541	0.636
Hypothesised OR	1.05	1.06	1.03	
Bayes factor	1	1	1	

Note. Bayes factors were calculated for each model of each SNP on the BayesFactor.info (<https://harry-tattan-birch.shinyapps.io/bayes-factor-calculator/>). The Bayes factor shows how much more or less probable the data are under the alternative hypothesis compared with a null hypothesis of zero effect. A Bayes factor greater than 3 indicates moderate relative evidence for an effect corresponding to a p-values of <.05 (Scott, Samaha, Chrisley, & Dienes, 2018), while a Bayes factor less than 1/3 indicates moderate relative evidence for no effect. A Bayes factor of 1 shows the data were equally probable under both the alternative and null hypotheses, so they provide no relative evidence at all.

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Supplementary Table S4. The thickness of the cortical regions that were altered in ASD for each genotype of *WNT2* SNPs

	rs2285545						rs2896218						rs6950765					
	AA (N = 89)		CA (N = 103)		CC (N = 46)		AA (N = 107)		AG (N = 104)		GG (N = 27)		CC (N = 18)		CG (N = 97)		GG (N = 123)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Left hemisphere	3.11	0.15	3.09	0.14	3.09	0.15	3.08	0.14	3.12	0.15	3.09	0.16	3.07	0.17	3.12	0.16	3.08	0.13
Right hemisphere	3.11	0.15	3.09	0.14	3.09	0.15	3.07	0.14	3.11	0.15	3.09	0.16	3.06	0.16	3.12	0.16	3.08	0.13
Right middle-posterior part of the <i>cingulate gyrus</i> and <i>sulcus</i> (pMCC)	3.39	0.22	3.37	0.20	3.38	0.21	3.36	0.19	3.41	0.22	3.34	0.24	3.31	0.26	3.41	0.22	3.37	0.19
Right posterior transverse collateral sulcus	2.72	0.29	2.77	0.26	2.74	0.25	2.74	0.28	2.77	0.26	2.74	0.25	2.75	0.24	2.76	0.26	2.74	0.28
Right <i>orbital gyrus</i>	3.40	0.20	3.40	0.20	3.41	0.19	3.38	0.18	3.42	0.21	3.40	0.23	3.36	0.23	3.43	0.21	3.38	0.18
Right superior segment of the <i>circular sulcus</i> of the <i>insula</i>	3.43	0.18	3.43	0.21	3.44	0.20	3.42	0.21	3.45	0.18	3.39	0.20	3.37	0.22	3.45	0.18	3.42	0.21
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	3.21	0.24	3.19	0.21	3.19	0.20	3.17	0.20	3.22	0.23	3.22	0.24	3.19	0.26	3.24	0.22	3.17	0.20
Right <i>triangular part of the inferior frontal gyrus</i>	3.32	0.27	3.27	0.23	3.29	0.22	3.27	0.22	3.31	0.26	3.28	0.24	3.25	0.23	3.33	0.26	3.26	0.23
Right <i>superior temporal sulcus</i> (parallel sulcus)	3.17	0.19	3.14	0.18	3.12	0.19	3.12	0.17	3.19	0.19	3.12	0.22	3.08	0.20	3.18	0.20	3.13	0.17
Right <i>orbital part of the inferior frontal gyrus</i>	3.46	0.28	3.38	0.28	3.38	0.26	3.40	0.26	3.39	0.30	3.50	0.32	3.49	0.24	3.41	0.31	3.39	0.27
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	3.44	0.21	3.45	0.20	3.45	0.21	3.43	0.20	3.45	0.22	3.46	0.19	3.42	0.20	3.46	0.22	3.43	0.20

Supplementary Table S5. SNP main effect in genotype association analysis, dominant model, recessive model, and over-dominant model in the whole sample

rs2285545	Genotype association		Dominant model		Recessive model		Over-dominant model	
	AA (n=89) vs. AC (n=103) vs. CC (n=46)		AA (n=89) vs. CA + CC (n=149)		AA + AC(n=192) vs. CC (n=49)		CA (n=103) vs. AA + CC (n=135)	
	F	p-values	F	p-values	F	p-values	F	p-values
Left hemisphere	0.103	0.902	0.046	0.831	0.204	0.652	0.011	0.918
Right hemisphere	0.231	0.794	0.204	0.652	0.412	0.522	0.002	0.968
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.188	0.829	0.086	0.770	0.372	0.542	0.052	0.821
Right posterior transverse collateral sulcus	1.799	0.168	1.779	0.184	3.070	0.081	0.031	0.860
Right <i>orbital gyri</i>	0.595	0.553	0.283	0.596	0.466	0.496	1.256	0.264
Right superior segment of the <i>circular sulcus of the insula</i>	0.576	0.563	0.505	0.478	0.228	0.633	0.997	0.319
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.117	0.889	0.093	0.761	0.216	0.642	0.000	0.986
Right <i>triangular part of the inferior frontal gyrus</i>	2.163	0.117	1.530	0.217	4.066	0.045	0.099	0.753
Right <i>superior temporal sulcus</i> (parallel sulcus)	0.911	0.404	0.954	0.330	0.246	0.621	1.931	0.166
Right <i>orbital part of the inferior</i>	1.718	0.182	3.420	0.066	0.725	0.395	1.349	0.247

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<i>frontal gyrus</i>								
<i>Right lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.218	0.805	0.404	0.525	0.005	0.943	0.344	0.558

rs2896218	Genotype association		Dominant model		Recessive model		Over-dominant model	
	AA (n=107) vs. AG (n=104) vs. GG (n=27)	F p-values	AA (n=107) vs. AG+GG (n=131)	F p-values	AA+AG (n=211) vs. GG (n=27)	F p-values	AG (n=104) vs. AA+GG (n=134)	F p-values
Left hemisphere	0.460	0.632	0.110	0.741	0.554	0.458	1.008	0.316
Right hemisphere	0.704	0.496	0.160	0.689	0.857	0.355	1.477	0.226
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	1.443	0.238	1.884	0.171	0.248	0.619	1.861	0.174
Right posterior transverse collateral sulcus	0.057	0.945	0.020	0.888	0.060	0.807	0.177	0.675
Right <i>orbital gyri</i>	0.521	0.594	0.000	0.983	0.922	0.338	0.875	0.351
Right superior segment of the <i>circular sulcus of the insula</i>	0.747	0.475	1.237	0.267	0.014	0.905	0.842	0.360
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.844	0.431	0.119	0.731	1.688	0.195	1.265	0.262
Right <i>triangular part of the inferior frontal gyrus</i>	0.211	0.810	0.129	0.720	0.157	0.692	0.490	0.485
Right <i>superior temporal sulcus</i>	2.084	0.127	1.154	0.284	1.645	0.201	4.101	0.044

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(parallel sulcus)							
Right orbital part of the inferior frontal gyrus	2.266	0.106	3.364	0.068	0.176	0.675	2.526 0.113
Right lateral occipito-temporal gyrus (fusiform gyrus, O4-T4)	0.389	0.678	0.266	0.607	0.717	0.398	0.245 0.621

rs6950765	Genotype association		Dominant model		Recessive model		Over-dominant model	
	GG (n=123) vs. GC (n=97) vs. CC (n=18)	F p-values	GG (n=123) vs. GC +CC (n=115)	F p-values	GG +GC (n=220) vs. CC (n=18)	F p-values	GC (n=97) vs. GG + CC (n=141)	F p-values
Left hemisphere	0.936	0.394	0.649	0.421	0.664	0.416	1.541	0.216
Right hemisphere	1.182	0.309	1.013	0.315	0.646	0.422	2.058	0.153
Right middle-posterior part of the cingulate gyrus and sulcus (pMCC)	1.758	0.175	0.235	0.628	2.498	0.115	1.713	0.192
Right posterior transverse collateral sulcus	0.038	0.962	0.062	0.803	0.001	0.978	0.083	0.773
Right orbital gyri	1.239	0.291	1.176	0.279	0.629	0.428	2.224	0.137
Right superior segment of the circular sulcus of the insula	0.785	0.457	0.002	0.960	1.421	0.234	0.373	0.542
Right posterior ramus (or segment) of the lateral sulcus (or fissure)	1.719	0.181	3.043	0.082	0.008	0.927	3.285	0.071
Right triangular part of the inferior	1.725	0.180	2.098	0.149	0.443	0.506	3.323	0.070

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<i>frontal gyrus</i>								
<i>Right superior temporal sulcus</i> (parallel sulcus)	2.303	0.102	0.459	0.499	3.026	0.083	2.613	0.107
<i>Right orbital part of the inferior frontal gyrus</i>	1.001	0.369	0.179	0.673	1.926	0.167	0.152	0.697
<i>Right lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.573	0.565	0.701	0.403	0.146	0.702	1.082	0.299

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Supplementary Table S6. Genetic associations in dominant model, recessive model, and over-dominant model in the whole sample

rs2285545	Dominant model		Recessive model		Over-dominant model	
	AA (n=89) vs. CA + CC (n=149)	F p-values	AA + AC(n=192) vs. CC (n=49)	F p-values	CA (n=103) vs. AA + CC (n=135)	F p-values
Left hemisphere	1.317	0.252	2.003	0.158	3.720	0.055
Right hemisphere	1.425	0.234	1.665	0.198	3.610	0.059
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.014	0.906	3.158	0.077	1.232	0.268
Right posterior transverse collateral sulcus	0.767	0.382	3.343	0.069	0.001	0.981
Right <i>orbital gyri</i>	0.780	0.378	0.287	0.593	2.518	0.114
Right superior segment of the <i>circular sulcus of the insula</i>	0.137	0.712	4.217	0.041	1.976	0.161
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.410	0.523	0.566	0.452	1.241	0.266
Right <i>triangular part of the inferior frontal gyrus</i>	1.189	0.277	1.664	0.198	2.510	0.115
Right <i>superior temporal sulcus</i> (parallel sulcus)	0.759	0.385	1.146	0.286	2.412	0.122
Right <i>orbital part of the inferior frontal gyrus</i>	0.628	0.429	0.812	0.368	2.085	0.150
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.054	0.817	0.959	0.328	0.802	0.371

rs2896218	Dominant model		Recessive model		Over-dominant model	
	AA (n=107) vs. AG+GG (n=131)	F p-values	AA+AG (n=211) vs. GG (n=27)	F p-values	AG (n=104) vs. AA+GG (n=134)	F p-values

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Left hemisphere	2.774	0.097	2.886	0.091	8.233	0.004
Right hemisphere	2.792	0.096	2.635	0.106	7.855	0.006
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.847	0.358	9.693	0.002	10.850	0.001
Right posterior transverse collateral sulcus	0.479	0.490	0.036	0.851	1.693	0.195
Right <i>orbital gyri</i>	0.031	0.860	6.703	0.010	6.020	0.015
Right superior segment of the <i>circular sulcus of the insula</i>	0.289	0.591	2.784	0.097	2.099	0.149
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.616	0.433	0.810	0.369	1.858	0.174
Right <i>triangular part of the inferior frontal gyrus</i>	2.728	0.100	1.612	0.206	5.343	0.022
Right <i>superior temporal sulcus</i> (parallel sulcus)	5.866	0.016	0.304	0.582	7.835	0.006
Right <i>orbital part of the inferior frontal gyrus</i>	0.000	0.992	0.247	0.620	0.135	0.714
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.002	0.961	1.070	0.302	0.444	0.506

rs6950765	Dominant model		Recessive model		Over-dominant model	
	GG (n=123) vs. GC +CC (n=115)	F p-values	GG +GC (n=220) vs. CC (n=18)	F p-values	GC (n=97) vs. GG + CC (n=141)	F p-values
Left hemisphere	1.640	0.202	5.902	0.016	8.042	0.005
Right hemisphere	1.643	0.201	5.822	0.017	7.963	0.005
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.284	0.594	16.489	0.000	10.616	0.001
Right posterior transverse collateral sulcus	0.110	0.741	0.114	0.736	0.264	0.608
Right <i>orbital gyri</i>	0.001	0.972	9.448	0.002	6.165	0.014

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Right superior segment of the <i>circular sulcus of the insula</i>	0.240	0.625	6.649	0.011	3.564	0.060
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.142	0.706	1.597	0.208	1.275	0.260
Right <i>triangular part of the inferior frontal gyrus</i>	2.033	0.155	3.068	0.081	4.931	0.027
Right <i>superior temporal sulcus</i> (parallel sulcus)	4.373	0.038	1.856	0.174	8.885	0.003
Right <i>orbital part of the inferior frontal gyrus</i>	0.438	0.509	0.279	0.598	1.146	0.286
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.171	0.680	2.302	0.131	2.105	0.148

Note. Red: p-value < 0.05, bold: FDR q-value < 0.05

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Supplementary Table S7. Age × SNP interaction in TDC and in ASD separately (only the models of positive interaction were presented)

TDC (n = 118)	rs2896218		Age × rs2896218					rs6950765		Age × rs6950765			
	Cohen's <i>d</i>	statistics	Cohen's <i>d</i>	statistics	R ²	Cohen's <i>d</i>	statistics	Cohen's <i>d</i>	statistics	R ²			
Left hemisphere (mean thickness)	AA vs. GG: 0.056 AG vs. GG: 0.167	F=2.14, <i>p</i> =0.122	age×AA: -0.618 age×AG: -0.765 age×GG: -0.271	F=4.08, <i>p</i> =0.020	0.55	CC vs. GG: 0.013 CG vs. GG: 0.187	F=2.18, <i>p</i> =0.118	age×CC: -0.255 age×CG: -0.760 age×GG: -0.625	F=4.05, <i>p</i> =0.0201	0.56			
Right hemisphere (mean thickness)	AA vs. GG: 0.095 AG vs. GG: 0.230	F=3.73, <i>p</i> =0.027	age×AA: -0.597 age×AG: -0.773 age×GG: -0.229	F=5.30, <i>p</i> =0.006	0.54	CC vs. GG: -0.015 CG vs. GG: 0.179	F=0.03, <i>p</i> =0.017	age×CC: -0.220 age×CG: -0.739 age×GG: -0.621	F=0.065, <i>p</i> =0.033	0.54			
Right middle-posterior part of the <i>cingulate gyrus and</i> <i>sulcus (pMCC)</i>	AA vs. GG: 0.211 AG vs. GG: 0.328	F=8.22, <i>p</i> =0.001**	age×AA: -0.379 age×AG: -0.617 age×GG: 0.0169	F=9.08, <i>p</i> =0.000**	0.39	CC vs. GG: -0.188 CG vs. GG: 0.212	F=6.72, <i>p</i> =0.002*	age×CC: 0.063 age×CG: -0.617 age×GG: -0.400	F=10.18, <i>p</i> <0.001**	0.40			
Right <i>orbital gyri</i>	AA vs. GG: 0.250 AG vs. GG: 0.328	F=6.38, <i>p</i> =0.002*	age×AA: -0.500 age×AG: -0.590 age×GG: 0.005	F=7.66, <i>p</i> =0.001**	0.42	CC vs. GG: -0.156 CG vs. GG: 0.087	F=2.57, <i>p</i> =0.081	age×CC: -0.038 age×CG: -0.526 age×GG: -0.490	F=4.49, <i>p</i> =0.013	0.39			
Right superior segment of the <i>circular sulcus of the</i> <i>insula</i>	—	—	—	—	—	CC vs. GG: -0.099 CG vs. GG: 0.145	F=2.53, <i>p</i> =0.084	age×CC: -0.001 age×CG: -0.447 age×GG: -0.293	F=4.19, <i>p</i> =0.018	0.28			
ASD (n = 122)	rs2896218		Age × rs2896218					rs6950765		Age × rs6950765			
	Cohen's <i>d</i>	statistics	Cohen's <i>d</i>	statistics	R ²	Cohen's <i>d</i>	statistics	Cohen's <i>d</i>	statistics	R ²			

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Left hemisphere mean thickness	—	—	—	—	—	CC vs. GG: -0.169 CG vs. GG: 0.188	F=5.85, <i>p</i> =0.004	age×CC: 0.102 age×CG: -0.296 age×GG: -0.095	F=4.24, <i>p</i> =0.017	0.15
Right hemisphere mean thickness	—	—	—	—	—	CC vs. GG: -0.148 CG vs. GG: 0.196	F=5.48, <i>p</i> =0.005	age×CC: 0.091 age×CG: -0.290 age×GG: -0.083	F=3.93, <i>p</i> =0.022	0.14
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	—	—	—	—	—	CC vs. GG: -0.216 CG vs. GG: 0.142	F=6.00, <i>p</i> =0.003*	age×CC: 0.135 age×CG: -0.244 age×GG: -0.099	F=3.96, <i>p</i> =0.022	0.15
Right <i>orbital gyrus</i>	—	—	—	—	—	CC vs. GG: -0.206 CG vs. GG: 0.062	F=3.74, <i>p</i> =0.027	age×CC: 0.123 age×CG: -0.194 age×GG: -0.202	F=3.32, <i>p</i> =0.040	0.14
Right <i>superior temporal sulcus</i> (parallel sulcus)	—	—	—	—	—	CC vs. GG: -0.145 CG vs. GG: 0.209	F=5.86, <i>p</i> =0.004*	age×CC: 0.073 age×CG: -0.276 age×GG: -0.079	F=3.30, <i>p</i> =0.041	0.17

Note. For the nine cortical regions, * False Discovery Rate correction: q-value < 0.05, ** q-value < 0.01

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Supplementary Table S8. Genetic associations in dominant model, recessive model, and over-dominant model in (a) ASD or (b) TDC

(a) ASD

rs2285545	Dominant model		Recessive model		Over-dominant model	
	AA (n=49) vs. CA+CC (n=68)	F p-values	AA+AC(n=94) vs. CC (n=23)	F p-values	CA (n=45) vs. AA+CC (n=72)	F p-values
Left hemisphere	0.985	0.322	1.483	0.225	0.986	0.323
Right hemisphere	1.090	0.298	1.208	0.273	0.909	0.342
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.046	0.831	2.819	0.095	0.005	0.946
Right posterior transverse collateral sulcus	1.234	0.268	2.382	0.124	0.004	0.947
Right <i>orbital gyri</i>	1.085	0.299	0.579	0.448	0.368	0.546
Right superior segment of the <i>circular sulcus of the insula</i>	0.010	0.920	3.005	0.084	3.608	0.060
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.339	0.561	0.465	0.496	0.131	0.718
Right <i>triangular part of the inferior frontal gyrus</i>	0.654	0.419	0.867	0.353	0.065	0.800
Right <i>superior temporal sulcus</i> (parallel sulcus)	0.618	0.433	0.898	0.344	0.597	0.441
Right <i>orbital part of the inferior frontal gyrus</i>	0.528	0.468	0.664	0.416	2.965	0.088
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.040	0.842	0.903	0.343	0.346	0.558

rs2896218	Dominant model		Recessive model		Over-dominant model	
	AA (n=49) vs. AG+GG (n=68)	F p-values	AA+AG (n=102) vs. GG (n=15)	F p-values	AG (n=53) vs. AA+GG (n=64)	F p-values

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Left hemisphere	0.775	0.381	1.884	0.173	3.831	0.053
Right hemisphere	0.749	0.389	1.427	0.235	3.329	0.071
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.229	0.633	4.093	0.045	4.901	0.029
Right posterior transverse collateral sulcus	1.618	0.206	0.635	0.427	0.625	0.431
Right <i>orbital gyri</i>	0.420	0.518	3.098	0.081	0.604	0.439
Right superior segment of the <i>circular sulcus of the insula</i>	0.071	0.790	1.062	0.305	0.911	0.342
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.430	0.513	0.169	0.682	0.962	0.329
Right <i>triangular part of the inferior frontal gyrus</i>	0.029	0.864	1.496	0.224	0.308	0.580
Right <i>superior temporal sulcus</i> (parallel sulcus)	1.278	0.261	1.118	0.293	3.649	0.059
Right <i>orbital part of the inferior frontal gyrus</i>	0.587	0.445	0.363	0.548	2.339	0.129
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.001	0.971	0.592	0.443	0.280	0.598

rs6950765	Dominant model		Recessive model		Over-dominant model	
	GG (n=57) vs. GC+CC (n=60)	F p-values	GG+GC (n=107) vs. CC (n=10)	F p-values	GC (n=50) vs. GG+CC (n=67)	F p-values
Left hemisphere	1.729	0.190	5.345	0.023	5.427	0.022
Right hemisphere	1.728	0.190	4.554	0.035	5.581	0.020
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.304	0.582	7.261	0.008	4.433	0.038
Right posterior transverse collateral sulcus	0.084	0.773	1.081	0.301	0.385	0.536
Right <i>orbital gyri</i>	0.000	0.998	7.756	0.006	1.142	0.288

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Right superior segment of the <i>circular sulcus of the insula</i>	0.301	0.584	3.276	0.073	1.245	0.267
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.149	0.700	1.542	0.217	1.820	0.180
Right <i>triangular part of the inferior frontal gyrus</i>	2.246	0.135	4.593	0.034	1.655	0.201
Right <i>superior temporal sulcus</i> (parallel sulcus)	4.444	0.036	3.885	0.051	4.681	0.033
Right <i>orbital part of the inferior frontal gyrus</i>	0.458	0.499	1.979	0.162	5.144	0.025
Right <i>lateral occipito-temporal gyrus</i> (fusiform gyrus, O4-T4)	0.174	0.677	2.277	0.134	1.958	0.165

(b) TDC

rs2285545	Dominant model		Recessive model		Over-dominant model	
	AA (n=40) vs. CA+CC (n=81)	F	AA+AC(n=98) vs. CC (n=23)	F	CA (n=58) vs. AA+CC (n=63)	F
Left hemisphere	1.466	0.229	1.170	0.282	1.328	0.252
Right hemisphere	1.108	0.295	1.476	0.227	1.183	0.279
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.410	0.523	2.483	0.118	1.275	0.261
Right posterior transverse collateral sulcus	0.036	0.850	1.029	0.313	0.046	0.831
Right <i>orbital gyri</i>	1.156	0.285	0.020	0.886	1.635	0.204
Right superior segment of the <i>circular sulcus of the insula</i>	0.516	0.474	2.031	0.157	1.113	0.294
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	1.217	0.272	1.254	0.265	1.929	0.168
Right <i>triangular part of the inferior frontal gyrus</i>	3.254	0.074	1.999	0.160	4.040	0.047
Right <i>superior temporal sulcus</i> (parallel sulcus)	1.118	0.292	1.869	0.174	2.096	0.150
Right <i>orbital part of the inferior frontal gyrus</i>	1.337	0.250	0.000	0.993	1.152	0.285

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Right lateral occipito-temporal gyrus (fusiform gyrus, O4-T4)	0.058	0.810	0.224	0.637	0.022	0.882
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rs2896218	Dominant model		Recessive model		Over-dominant model	
	AA (n=58) vs. AG+GG (n=63)	F p-values	AA+AG (n=109) vs. GG (n=12)	F p-values	AG (n=51) vs. AA+GG (n=70)	F p-values
Left hemisphere	1.113	0.294	2.838	0.095	3.872	0.052
Right hemisphere	1.158	0.284	4.343	0.039	5.252	0.024
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.456	0.501	10.793	0.001	8.600	0.004
Right posterior transverse collateral sulcus	0.090	0.765	0.001	0.974	1.069	0.303
Right <i>orbital gyri</i>	0.104	0.748	12.536	0.001	7.238	0.008
Right superior segment of the <i>circular sulcus of the insula</i>	0.060	0.806	4.114	0.045	1.793	0.183
Right <i>posterior ramus</i> (or segment) of the <i>lateral sulcus</i> (or fissure)	0.482	0.489	0.339	0.562	0.513	0.475
Right <i>triangular part of the inferior frontal gyrus</i>	1.123	0.292	0.603	0.439	1.548	0.216
Right <i>superior temporal sulcus</i> (parallel sulcus)	3.324	0.071	0.083	0.774	3.025	0.085
Right <i>orbital part of the inferior frontal gyrus</i>	0.083	0.773	0.887	0.348	0.203	0.653
Right lateral occipito-temporal gyrus (fusiform gyrus, O4-T4)	0.028	0.868	1.492	0.224	0.226	0.636

rs6950765	Dominant model		Recessive model		Over-dominant model	
	GG (n=123) vs. GC +CC (n=115)	F p-values	GG +GC (n=220) vs. CC (n=18)	F p-values	GC (n=97) vs. GG + CC (n=141)	F p-values

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Left hemisphere	1.567	0.213	2.586	0.111	4.230	0.042
Right hemisphere	0.986	0.323	3.627	0.059	3.927	0.050
Right middle-posterior part of the <i>cingulate gyrus and sulcus</i> (pMCC)	0.338	0.562	13.047	0.000	9.050	0.003
Right posterior transverse collateral sulcus	0.004	0.952	0.001	0.979	0.472	0.493
Right <i>orbital gyri</i>	0.030	0.863	7.335	0.008	4.447	0.037
Right superior segment of the <i>circular sulcus of the insula</i>	0.378	0.540	4.723	0.032	3.518	0.063
Right <i>posterior ramus (or segment) of the lateral sulcus (or fissure)</i>	0.554	0.458	0.198	0.657	0.439	0.509
Right <i>triangular part of the inferior frontal gyrus</i>	2.241	0.137	0.253	0.616	1.836	0.178
Right <i>superior temporal sulcus (parallel sulcus)</i>	1.896	0.171	0.089	0.766	1.783	0.185
Right <i>orbital part of the inferior frontal gyrus</i>	0.060	0.807	0.056	0.814	0.011	0.918
Right <i>lateral occipito-temporal gyrus (fusiform gyrus, O4-T4)</i>	0.131	0.718	1.331	0.251	0.969	0.327

Note. Red: p-value < 0.05, bold: FDR q-value < 0.05

Appendix 1 to Chien YL, Chen YC, Chiu YN, et al. A translational exploration of the effects of *WNT2* variants on altered cortical structures in autism spectrum disorder. *J Psychiatry Neurosci* 2021. doi: 10.1503/jpn.210022

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Supplementary Table S9. The SNP-by-age interaction on the cortical thickness across the 74 brain regions bilaterally: (a) ASD + TDC, (b) ASD, and (c) TDC. **Note.** All the SNP main effect and SNP-by-case interaction did not pass FDR correction, therefore those results were not presented.

(a) ASD + TDC

Cortical thickness	<u>Age × rs2285545</u>		<u>Age × rs2896218</u>		<u>Age × rs6950765</u>	
	F	p-values	F	p-values	F	p-values
lh_G_and_S_frontomargin	0.164	0.686	3.648	0.028	2.986	0.052
lh_G_and_S_occipital_inf	0.568	0.452	2.696	0.070	1.643	0.196
lh_G_and_S_paracentrals	1.571	0.211	2.485	0.086	1.287	0.278
lh_G_and_S_subcentrals	0.079	0.779	1.140	0.322	1.578	0.209
lh_G_and_S_transv_frontopol	0.397	0.529	2.410	0.092	2.349	0.098
lh_G_and_S_cingul_Ants	0.103	0.749	1.921	0.149	2.190	0.114
lh_G_and_S_cingul_Mid_Ant	0.338	0.562	0.607	0.546	0.713	0.491
lh_G_and_S_cingul_Mid_Post	0.204	0.652	2.842	0.060	3.863	0.022
lh_G_cingul_Post_dorsal	0.002	0.964	2.343	0.098	3.144	0.045
lh_G_cingul_Post_ventral	0.304	0.582	0.073	0.929	0.471	0.625
lh_G_cuneuss	0.516	0.473	3.409	0.035	4.363	0.014
lh_G_front_inf_Opercular	2.145	0.144	1.354	0.260	2.612	0.076
lh_G_front_inf_Orbitals	1.456	0.229	0.886	0.414	1.222	0.297
lh_G_front_inf_Triangul	2.663	0.104	4.706	0.010	4.596	0.011
lh_G_front_middles	4.317	0.039	4.471	0.012	3.976	0.020
lh_G_front_suprs	0.383	0.537	7.935	0.000	6.495	0.002
lh_G_Ins_lg_and_S_cent_ins	0.268	0.605	3.482	0.032	5.401	0.005
lh_G_insular_shorts	0.315	0.575	1.384	0.253	2.085	0.127
lh_G_occipital_middles	0.025	0.874	0.401	0.670	0.430	0.651
lh_G_occipital_suprs	0.663	0.416	3.193	0.043	4.902	0.008
lh_G_oc_temp_lat_fusifor	0.071	0.790	0.452	0.637	0.745	0.476
lh_G_oc_temp_med_Lingual	0.238	0.626	4.350	0.014	5.496	0.005
lh_G_oc_temp_med_Parahip	0.393	0.532	0.951	0.388	0.836	0.435
lh_G_orbitals	0.563	0.454	5.198	0.006	5.343	0.005
lh_G_pariet_inf_Angular	2.702	0.102	2.980	0.053	3.281	0.039
lh_G_pariet_inf_Supramar	0.312	0.577	3.533	0.031	5.044	0.007

Appendix 1 to Chien YL, Chen YC, Chiu YN, et al. A translational exploration of the effects of *WNT2* variants on altered cortical structures in autism spectrum disorder. *J Psychiatry Neurosci* 2021. doi: 10.1503/jpn.210022

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lh_G_parietal_suprs	4.424	0.037	3.435	0.034	3.647	0.028
lh_G_postcentralrs	1.793	0.182	1.506	0.224	2.230	0.110
lh_G_precentralrs	0.150	0.699	1.189	0.306	0.229	0.796
lh_G_precuneusss	1.622	0.204	5.136	0.007	4.512	0.012
lh_G_rectuss	1.747	0.188	1.126	0.326	2.518	0.083
lh_G_subcallosals	0.429	0.513	0.279	0.757	0.167	0.846
lh_G_temp_sup_G_T_transv	0.115	0.734	0.364	0.695	0.441	0.644
lh_G_temp_sup_Laterals	0.163	0.687	0.265	0.767	0.188	0.829
lh_G_temp_sup_Plan_polar	1.981	0.161	0.677	0.509	0.407	0.666
lh_G_temp_sup_Plan_tempo	0.029	0.866	0.701	0.497	1.504	0.225
lh_G_temporal_infs	0.210	0.647	3.064	0.049	2.582	0.078
lh_G_temporal_middles	0.495	0.483	0.279	0.757	0.197	0.822
lh_Lat_Fis_ant_Horizont	2.092	0.149	1.437	0.240	1.262	0.285
lh_Lat_Fis_ant_Vertical	0.225	0.635	2.584	0.078	3.456	0.033
lh_Lat_Fis_posts	0.030	0.863	1.882	0.155	4.532	0.012
lh_Pole_occipitals	0.006	0.939	0.217	0.805	0.040	0.961
lh_Pole_temporals	0.268	0.605	2.218	0.111	2.201	0.113
lh_S_calcarines	0.257	0.613	4.539	0.012	5.898	0.003
lh_S_centralrs	0.099	0.753	0.511	0.601	0.539	0.584
lh_S_cingul_Marginaliss	1.460	0.228	2.305	0.102	5.689	0.004
lh_S_circular_insula_ant	1.720	0.191	2.313	0.101	2.099	0.125
lh_S_circular_insula_inf	1.846	0.176	3.651	0.028	3.200	0.043
lh_S_circular_insula_sup	0.097	0.755	1.551	0.214	3.350	0.037
lh_S_collat_transv_ants	2.067	0.152	1.545	0.215	3.102	0.047
lh_S_collat_transv_post	0.029	0.866	0.894	0.410	1.338	0.264
lh_S_front_infs	0.000	0.986	2.611	0.076	3.867	0.022
lh_S_front_middles	0.064	0.800	1.738	0.178	1.557	0.213
lh_S_front_suprs	0.976	0.324	4.217	0.016	5.951	0.003
lh_S_interm_prim_Jensen	0.147	0.701	0.453	0.636	1.102	0.334
lh_S_intrapariet_and_P_trans	1.221	0.270	5.371	0.005	4.575	0.011
lh_S_oc_middle_and_Lunatus	0.142	0.707	3.078	0.048	4.965	0.008
lh_S_oc_sup_and_transversal	0.834	0.362	2.046	0.132	2.792	0.063
lh_S_occipital_ants	0.628	0.429	1.474	0.231	1.686	0.188
lh_S_oc_temp_lats	1.406	0.237	3.456	0.033	3.915	0.021

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lh_S_oc_temp_med_and_Lingual	1.315	0.253	1.311	0.272	1.403	0.248
lh_S_orbital_laterals	0.466	0.495	0.977	0.378	2.451	0.088
lh_S_orbital_med_olfact	0.523	0.470	2.353	0.097	5.275	0.006
lh_S_orbital_H_Shapeds	0.933	0.335	7.390	0.001	9.969	0.000
lh_S_parieto_occipitals	0.119	0.731	2.701	0.069	4.260	0.015
lh_S_pericallosals	0.330	0.566	1.040	0.355	1.502	0.225
lh_S_postcentrals	1.414	0.236	7.627	0.001	7.813	0.001
lh_S_precentral_inf_part	0.824	0.365	2.203	0.113	1.612	0.202
lh_S_precentral_sup_part	0.543	0.462	2.568	0.079	2.190	0.114
lh_S_suborbitals	4.105	0.044	3.934	0.021	3.463	0.033
lh_S_subparietals	0.166	0.684	1.846	0.160	1.527	0.219
lh_S_temporal_infs	0.040	0.841	2.681	0.071	3.149	0.045
lh_S_temporal_sup	0.180	0.672	2.289	0.104	4.698	0.010
lh_S_temporal_transverse	0.675	0.412	0.416	0.660	0.684	0.506
rh_G_and_S_frontomargin	1.260	0.263	2.905	0.057	2.541	0.081
rh_G_and_S_occipital_inf	0.124	0.725	1.797	0.168	2.418	0.091
rh_G_and_S_paracentrals	0.662	0.417	1.007	0.367	1.026	0.360
rh_G_and_S_subcentrals	0.482	0.488	1.398	0.249	1.360	0.259
rh_G_and_S_transv_frontopol	0.548	0.460	2.413	0.092	2.042	0.132
rh_G_and_S_cingul_Ants	1.197	0.275	5.246	0.006	7.913	0.000
rh_G_and_S_cingul_Mid_Ant	0.122	0.727	2.969	0.053	3.201	0.043
rh_G_and_S_cingul_Mid_Post	0.014	0.906	8.028	0.000	11.043	0.000
rh_G_cingul_Post_dorsal	0.306	0.581	1.629	0.198	2.363	0.096
rh_G_cingul_Post_ventral	0.018	0.894	0.881	0.416	1.390	0.251
rh_G_cuneuss	0.035	0.852	4.932	0.008	4.582	0.011
rh_G_front_inf_Opercular	0.670	0.414	1.364	0.258	1.545	0.215
rh_G_front_inf_Orbitals	0.628	0.429	0.239	0.788	0.736	0.480
rh_G_front_inf_Triangul	1.189	0.277	3.827	0.023	4.058	0.019
rh_G_front_middles	4.658	0.032	6.515	0.002	6.185	0.002
rh_G_front_sup	1.543	0.215	4.591	0.011	4.210	0.016
rh_G_Ins_lg_and_S_cent_ins	0.690	0.407	0.007	0.993	0.104	0.902
rh_G_insular_shorts	1.000	0.318	0.967	0.382	2.953	0.054
rh_G_occipital_middles	0.146	0.702	1.591	0.206	2.130	0.121
rh_G_occipital_sup	0.269	0.604	1.102	0.334	1.429	0.242

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rh_G_oc_temp_lat_fusifor	0.054	0.817	0.589	0.556	1.678	0.189
rh_G_oc_temp_med_Lingual	0.277	0.599	4.107	0.018	5.414	0.005
rh_G_oc_temp_med_Parahip	0.598	0.440	1.123	0.327	1.490	0.228
rh_G_orbitals	0.780	0.378	4.269	0.015	5.477	0.005
rh_G_pariet_inf_Angular	4.831	0.029	2.293	0.103	2.075	0.128
rh_G_pariet_inf_Supramar	0.119	0.731	1.717	0.182	1.521	0.221
rh_G_parietal_sup	2.915	0.089	3.528	0.031	3.057	0.049
rh_G_postcentral	0.276	0.600	2.681	0.071	2.841	0.060
rh_G_precentral	0.025	0.875	1.353	0.261	0.863	0.423
rh_G_precuneus	2.948	0.087	6.030	0.003	5.401	0.005
rh_G_rectuss	3.076	0.081	2.709	0.069	3.068	0.048
rh_G_subcallosals	0.217	0.641	1.020	0.362	0.494	0.611
rh_G_temp_sup_G_T_transv	0.704	0.402	0.322	0.725	0.125	0.882
rh_G_temp_sup_Laterals	1.869	0.173	0.283	0.754	0.151	0.860
rh_G_temp_sup_Plan_polar	1.874	0.172	1.479	0.230	0.761	0.468
rh_G_temp_sup_Plan_tempo	0.116	0.734	2.917	0.056	2.144	0.119
rh_G_temporal_infs	0.930	0.336	0.678	0.508	1.556	0.213
rh_G_temporal_middles	4.238	0.041	0.562	0.571	0.720	0.488
rh_Lat_Fis_ant_Horizont	0.266	0.606	1.988	0.139	1.734	0.179
rh_Lat_Fis_ant_Vertical	2.324	0.129	1.161	0.315	0.414	0.661
rh_Lat_Fis_posts	0.410	0.523	1.160	0.315	1.106	0.333
rh_Pole_occipitals	0.961	0.328	3.809	0.024	3.514	0.031
rh_Pole_temporals	0.580	0.447	0.451	0.638	1.027	0.360
rh_S_calcarines	0.008	0.927	4.057	0.019	3.938	0.021
rh_S_centrales	0.352	0.553	1.420	0.244	2.599	0.077
rh_S_cingul_Marginalis	3.347	0.069	4.990	0.008	5.741	0.004
rh_S_circular_insula_ant	0.942	0.333	1.912	0.150	3.009	0.051
rh_S_circular_insula_inf	2.014	0.157	0.131	0.877	0.120	0.887
rh_S_circular_insula_sup	0.137	0.712	2.291	0.104	4.682	0.010
rh_S_collat_transv_ants	0.855	0.356	2.424	0.091	5.187	0.006
rh_S_collat_transv_post	0.767	0.382	0.419	0.658	0.076	0.927
rh_S_front_infs	0.805	0.371	2.229	0.110	3.376	0.036
rh_S_front_middles	0.854	0.357	2.933	0.055	3.314	0.038
rh_S_front_suprs	0.828	0.364	2.852	0.060	4.274	0.015

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rh_S_interm_prim_Jensen	3.812	0.052	6.090	0.003	5.268	0.006
rh_S_intrapariet_and_P_trans	0.820	0.366	3.197	0.043	3.382	0.036
rh_S_oc_middle_and_Lunatus	3.369	0.068	0.118	0.888	0.039	0.961
rh_S_oc_sup_and_transversal	0.050	0.823	1.777	0.171	3.195	0.043
rh_S_occipital_ants	0.118	0.732	0.296	0.744	1.150	0.318
rh_S_oc_temp_lats	0.239	0.625	0.958	0.385	2.554	0.080
rh_S_oc_temp_med_and_Lingual	0.120	0.729	2.821	0.062	5.488	0.005
rh_S_orbital_laterals	1.033	0.311	2.913	0.056	3.453	0.033
rh_S_orbital_med_olfact	1.467	0.227	1.356	0.260	1.681	0.189
rh_S_orbital_H_Shapeds	3.334	0.069	4.266	0.015	4.440	0.013
rh_S_parieto_occipitals	1.517	0.219	2.532	0.082	3.442	0.034
rh_S_pericallosals	0.703	0.403	0.594	0.553	0.819	0.442
rh_S_postcentral	2.210	0.138	3.683	0.027	3.258	0.040
rh_S_precentral_inf_part	0.966	0.327	1.205	0.302	0.967	0.382
rh_S_precentral_sup_part	0.022	0.883	1.313	0.271	1.393	0.250
rh_S_suborbitals	3.026	0.083	1.406	0.247	0.643	0.527
rh_S_subparietals	0.087	0.768	3.070	0.048	2.871	0.059
rh_S_temporal_infs	0.615	0.434	0.486	0.616	1.106	0.333
rh_S_temporal_suprs	0.759	0.385	4.266	0.015	4.826	0.009
rh_S_temporal_transverse	0.618	0.433	0.543	0.582	0.275	0.760

Note. *p*-values < 0.05, marked in red; FDR *q*-values < 0.05, in bold font

(b) ASD

	Age × rs2285545		Age × rs2896218		Age × rs6950765	
	F	p-values	F	p-values	F	p-values
lh_G_and_S_frontomargin	1.894	0.153	2.112	0.100	2.166	0.093
lh_G_and_S_occipital_inf	0.922	0.399	0.714	0.545	1.587	0.193
lh_G_and_S_paracentrals	5.328	0.005	2.357	0.073	3.341	0.020
lh_G_and_S_subcentrals	5.005	0.007	2.690	0.047	2.709	0.046
lh_G_and_S_transv_frontopol	0.334	0.717	0.885	0.449	2.703	0.046
lh_G_and_S_cingul_Ants	1.516	0.222	1.754	0.157	1.451	0.229
lh_G_and_S_cingul_Mid_Ant	4.914	0.008	3.118	0.027	2.978	0.032
lh_G_and_S_cingul_Mid_Post	4.948	0.008	2.948	0.034	3.249	0.023
lh_G_cingul_Post_dorsal	3.541	0.031	2.378	0.071	2.865	0.038

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lh_G_cingul_Post_ventral	1.972	0.142	1.362	0.255	1.757	0.156
lh_G_cuneuss	3.211	0.042	1.344	0.261	2.306	0.078
lh_G_front_inf_Opercular	2.609	0.076	0.638	0.591	0.403	0.751
lh_G_front_inf_Orbitals	2.438	0.090	2.135	0.097	2.860	0.038
lh_G_front_inf_Triangul	3.234	0.041	0.825	0.481	0.628	0.598
lh_G_front_middles	2.809	0.062	2.168	0.093	3.115	0.027
lh_G_front_suprs	3.033	0.050	3.271	0.022	4.432	0.005
lh_G_Ins_lg_and_S_cent_ins	2.822	0.062	1.497	0.216	2.469	0.063
lh_G_insular_shorts	0.375	0.688	0.793	0.499	1.415	0.239
lh_G_occipital_middles	2.545	0.081	1.645	0.180	1.631	0.183
lh_G_occipital_suprs	3.575	0.030	2.508	0.060	3.214	0.024
lh_G_oc_temp_lat_fusifor	0.836	0.435	0.498	0.684	1.233	0.299
lh_G_oc_temp_med_Lingual	1.597	0.205	0.917	0.433	1.227	0.301
lh_G_oc_temp_med_Parahip	6.723	0.001	4.737	0.003	4.422	0.005
lh_G_orbitals	3.150	0.045	4.293	0.006	5.171	0.002
lh_G_pariet_inf_Angular	5.501	0.005	4.472	0.005	5.397	0.001
lh_G_pariet_inf_Supramar	2.882	0.058	2.405	0.068	3.024	0.030
lh_G_parietal_suprs	6.412	0.002	3.426	0.018	4.358	0.005
lh_G_postcentralss	1.744	0.177	0.634	0.594	0.392	0.759
lh_G_precentralss	2.700	0.069	1.778	0.152	1.920	0.127
lh_G_precuneuss	5.144	0.007	4.039	0.008	4.208	0.006
lh_G_rectuss	1.459	0.235	0.538	0.657	0.602	0.614
lh_G_subcallosals	0.164	0.848	0.147	0.931	0.491	0.689
lh_G_temp_sup_G_T_transv	3.153	0.045	0.470	0.703	0.497	0.684
lh_G_temp_sup_Laterals	3.245	0.041	2.483	0.062	2.210	0.088
lh_G_temp_sup_Plan_polar	2.249	0.108	1.260	0.289	1.616	0.187
lh_G_temp_sup_Plan_tempo	1.592	0.206	1.362	0.255	1.923	0.127
lh_G_temporal_infs	6.188	0.002	4.575	0.004	4.517	0.004
lh_G_temporal_middles	3.293	0.039	2.369	0.071	2.286	0.080
lh_Lat_Fis_ant_Horizont	1.272	0.282	0.994	0.397	1.038	0.377
lh_Lat_Fis_ant_Vertical	3.793	0.024	0.096	0.962	0.035	0.991
lh_Lat_Fis_posts	1.451	0.237	1.155	0.328	1.669	0.174
lh_Pole_occipitals	2.730	0.067	1.092	0.353	1.394	0.245
lh_Pole_temporals	0.294	0.745	1.123	0.341	0.934	0.425

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lh_S_calcarines	0.350	0.705	0.421	0.738	0.873	0.456
lh_S_centrals	3.417	0.034	2.375	0.071	2.104	0.101
lh_S_cingul_Marginaliss	3.961	0.020	0.879	0.453	1.252	0.292
lh_S_circular_insula_ant	3.275	0.040	2.192	0.090	3.547	0.015
lh_S_circular_insula_inf	2.357	0.097	1.717	0.164	1.349	0.259
lh_S_circular_insula_sup	3.362	0.036	2.177	0.092	2.705	0.046
lh_S_collat_transv_ants	0.636	0.530	1.567	0.198	2.811	0.040
lh_S_collat_transv_post	2.073	0.128	1.956	0.121	2.527	0.058
lh_S_front_infs	3.791	0.024	3.182	0.025	4.405	0.005
lh_S_front_middles	3.060	0.049	1.645	0.180	1.611	0.188
lh_S_front_suprs	3.098	0.047	1.714	0.165	2.221	0.086
lh_S_interm_prim_Jensen	0.464	0.629	0.427	0.734	0.921	0.431
lh_S_intrapariet_and_P_trans	3.493	0.032	1.098	0.351	1.522	0.210
lh_S_oc_middle_and_Lunatus	1.497	0.226	1.113	0.345	0.930	0.427
lh_S_oc_sup_and_transversal	9.511	0.000	2.826	0.039	2.807	0.040
lh_S_occipital_ants	4.900	0.008	0.732	0.534	1.192	0.314
lh_S_oc_temp_lats	1.321	0.269	2.783	0.042	1.814	0.145
lh_S_oc_temp_med_and_Lingual	2.065	0.129	1.578	0.196	2.173	0.092
lh_S_orbital_laterals	0.820	0.442	1.500	0.215	1.889	0.132
lh_S_orbital_med_olfact	0.052	0.949	1.165	0.324	1.447	0.230
lh_S_orbital_H_Shapeds	0.969	0.381	2.347	0.074	3.070	0.029
lh_S_parieto_occipitals	4.195	0.016	4.105	0.007	5.228	0.002
lh_S_pericallosals	0.274	0.761	1.842	0.140	2.673	0.048
lh_S_postcentral	3.076	0.048	1.228	0.300	1.037	0.377
lh_S_precentral_inf_part	1.775	0.172	1.413	0.240	1.675	0.173
lh_S_precentral_sup_part	1.405	0.248	1.080	0.358	1.336	0.264
lh_S_suborbitals	1.988	0.139	1.676	0.173	0.936	0.424
lh_S_subparietals	0.705	0.495	0.686	0.561	1.331	0.265
lh_S_temporal_infs	0.314	0.731	0.939	0.422	0.551	0.648
lh_S_temporal_suprs	3.825	0.023	2.821	0.040	3.404	0.018
lh_S_temporal_transverse	4.311	0.015	1.306	0.273	1.197	0.312
rh_G_and_S_frontomargin	3.467	0.033	2.257	0.083	2.389	0.070
rh_G_and_S_occipital_inf	1.275	0.281	0.821	0.484	1.351	0.259
rh_G_and_S_paracentrals	3.151	0.045	1.845	0.140	2.708	0.046

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rh_G_and_S_subcentrals	1.711	0.183	1.562	0.199	1.901	0.130
rh_G_and_S_transv_frontopol	2.223	0.111	1.386	0.248	0.872	0.456
rh_G_and_S_cingul_Ants	2.910	0.056	1.204	0.309	1.867	0.136
rh_G_and_S_cingul_Mid_Ant	2.980	0.053	1.667	0.175	1.734	0.161
rh_G_and_S_cingul_Mid_Post	7.767	0.001	4.801	0.003	5.761	0.001
rh_G_cingul_Post_dorsal	2.743	0.066	2.343	0.074	3.255	0.022
rh_G_cingul_Post_ventral	2.089	0.126	1.732	0.161	2.243	0.084
rh_G_cuneuss	1.788	0.170	0.590	0.622	1.007	0.391
rh_G_front_inf_Opercular	1.845	0.160	0.813	0.488	1.560	0.200
rh_G_front_inf_Orbitals	3.510	0.032	2.808	0.040	2.619	0.052
rh_G_front_inf_Triangul	3.541	0.031	4.331	0.005	3.664	0.013
rh_G_front_middles	5.277	0.006	3.740	0.012	5.370	0.001
rh_G_front_suprs	3.999	0.020	2.427	0.066	3.839	0.010
rh_G_Ins_lg_and_S_cent_ins	2.420	0.091	1.997	0.115	2.711	0.046
rh_G_insular_shorts	0.606	0.547	0.661	0.577	2.724	0.045
rh_G_occipital_middles	5.076	0.007	3.458	0.017	3.147	0.026
rh_G_occipital_suprs	1.546	0.215	0.852	0.467	1.141	0.333
rh_G_oc_temp_lat_fusifor	6.477	0.002	3.631	0.014	3.719	0.012
rh_G_oc_temp_med_Lingual	3.190	0.043	1.381	0.249	1.418	0.238
rh_G_oc_temp_med_Parahip	2.363	0.096	1.685	0.171	2.190	0.090
rh_G_orbitals	7.944	0.000	5.010	0.002	5.086	0.002
rh_G_pariet_inf_Angular	2.330	0.100	2.005	0.114	3.422	0.018
rh_G_pariet_inf_Supramar	3.867	0.022	2.971	0.033	3.423	0.018
rh_G_parietal_suprs	4.441	0.013	2.228	0.086	3.613	0.014
rh_G_postcentralrs	1.127	0.326	0.324	0.808	0.274	0.844
rh_G_precentralrs	1.673	0.190	0.922	0.431	1.682	0.172
rh_G_precuneuss	5.338	0.005	2.729	0.045	3.303	0.021
rh_G_rectuss	0.183	0.833	0.972	0.407	0.227	0.877
rh_G_subcallosals	0.088	0.915	0.149	0.930	0.578	0.630
rh_G_temp_sup_G_T_transv	2.341	0.099	1.891	0.132	1.917	0.128
rh_G_temp_sup_Laterals	2.556	0.080	1.644	0.180	1.655	0.178
rh_G_temp_sup_Plan_polar	0.050	0.951	0.971	0.407	0.376	0.770
rh_G_temp_sup_Plan_tempo	1.315	0.271	1.212	0.306	0.963	0.411
rh_G_temporal_infs	4.121	0.017	0.909	0.437	1.202	0.310

Appendix 1 to Chien YL, Chen YC, Chiu YN, et al. A translational exploration of the effects of *WNT2* variants on altered cortical structures in autism spectrum disorder. *J Psychiatry Neurosci* 2021. doi: 10.1503/jpn.210022

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rh_G_temporal_middles	7.111	0.001	2.381	0.070	2.546	0.057
rh_Lat_Fis_ant_Horizont	0.750	0.474	2.313	0.077	1.556	0.201
rh_Lat_Fis_ant_Vertical	1.550	0.215	2.260	0.082	0.920	0.432
rh_Lat_Fis_posts	5.256	0.006	4.217	0.006	5.616	0.001
rh_Pole_occipitals	2.531	0.082	1.412	0.240	1.647	0.179
rh_Pole_temporals	4.075	0.018	3.344	0.020	3.399	0.019
rh_S_calcarines	2.725	0.068	1.367	0.254	1.642	0.181
rh_S_centrals	3.376	0.036	1.565	0.199	1.641	0.181
rh_S_cingul_Marginaliss	1.797	0.168	1.185	0.316	1.361	0.256
rh_S_circular_insula_ant	2.041	0.132	1.127	0.339	1.400	0.244
rh_S_circular_insula_inf	2.368	0.096	1.136	0.335	1.539	0.205
rh_S_circular_insula_sup	4.641	0.011	3.051	0.029	3.801	0.011
rh_S_collat_transv_ants	2.738	0.067	2.110	0.100	1.898	0.131
rh_S_collat_transv_post	4.871	0.008	3.775	0.011	3.580	0.015
rh_S_front_infs	4.247	0.015	2.534	0.058	4.049	0.008
rh_S_front_middles	4.978	0.008	2.088	0.103	3.008	0.031
rh_S_front_suprs	4.761	0.009	1.719	0.164	2.419	0.067
rh_S_interm_prim_Jensen	3.427	0.034	2.546	0.057	2.294	0.079
rh_S_intrapariet_and_P_trans	6.888	0.001	3.359	0.020	3.677	0.013
rh_S_oc_middle_and_Lunatus	2.037	0.133	1.388	0.247	1.828	0.143
rh_S_oc_sup_and_transversal	5.262	0.006	2.598	0.053	2.334	0.075
rh_S_occipital_ants	3.567	0.030	0.681	0.564	0.889	0.447
rh_S_oc_temp_lats	2.241	0.109	0.886	0.449	0.550	0.649
rh_S_oc_temp_med_and_Lingual	2.197	0.114	0.716	0.543	0.524	0.666
rh_S_orbital_laterals	4.774	0.009	2.855	0.038	2.373	0.071
rh_S_orbital_med_olfact	1.061	0.348	0.579	0.629	0.686	0.561
rh_S_orbital_H_Shapeds	3.153	0.045	2.257	0.083	1.941	0.124
rh_S_parieto_occipitals	4.515	0.012	1.923	0.127	1.815	0.145
rh_S_pericallosals	1.992	0.139	0.263	0.852	0.279	0.841
rh_S_postcentralss	6.068	0.003	1.191	0.314	1.172	0.321
rh_S_precentral_inf_part	3.501	0.032	2.083	0.103	2.057	0.107
rh_S_precentral_sup_part	1.144	0.320	0.715	0.544	0.697	0.555
rh_S_suborbitals	0.327	0.722	0.389	0.761	0.339	0.797
rh_S_subparietals	0.311	0.733	0.316	0.814	0.717	0.543

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rh_S_temporal_infs	2.780	0.064	1.645	0.180	0.716	0.543
rh_S_temporal_suprs	5.032	0.007	3.622	0.014	5.043	0.002
rh_S_temporal_transverse	0.762	0.468	0.764	0.515	0.926	0.429

Note. *p*-values < 0.05, marked in red; FDR *q*-values < 0.05, in bold font

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	<u>Age × rs2285545</u>		<u>Age × rs2896218</u>		<u>Age × rs6950765</u>	
	F	p-values	F	p-values	F	p-values
lh_G_and_S_frontomargin	1.894	0.153	2.112	0.100	2.166	0.093
lh_G_and_S_occipital_inf	0.922	0.399	0.714	0.545	1.587	0.193
lh_G_and_S_paracentrals	5.328	0.005	2.357	0.073	3.341	0.020
lh_G_and_S_subcentrals	5.005	0.007	2.690	0.047	2.709	0.046
lh_G_and_S_transv_frontopol	0.334	0.717	0.885	0.449	2.703	0.046
lh_G_and_S_cingul_Ants	1.516	0.222	1.754	0.157	1.451	0.229
lh_G_and_S_cingul_Mid_Ant	4.914	0.008	3.118	0.027	2.978	0.032
lh_G_and_S_cingul_Mid_Post	4.948	0.008	2.948	0.034	3.249	0.023
lh_G_cingul_Post_dorsal	3.541	0.031	2.378	0.071	2.865	0.038
lh_G_cingul_Post_ventral	1.972	0.142	1.362	0.255	1.757	0.156
lh_G_cuneuss	3.211	0.042	1.344	0.261	2.306	0.078
lh_G_front_inf_Opercular	2.609	0.076	0.638	0.591	0.403	0.751
lh_G_front_inf_Orbitals	2.438	0.090	2.135	0.097	2.860	0.038
lh_G_front_inf_Triangul	3.234	0.041	0.825	0.481	0.628	0.598
lh_G_front_middles	2.809	0.062	2.168	0.093	3.115	0.027
lh_G_front_suprs	3.033	0.050	3.271	0.022	4.432	0.005
lh_G_Ins_lg_and_S_cent_ins	2.822	0.062	1.497	0.216	2.469	0.063
lh_G_insular_shorts	0.375	0.688	0.793	0.499	1.415	0.239
lh_G_occipital_middles	2.545	0.081	1.645	0.180	1.631	0.183
lh_G_occipital_suprs	3.575	0.030	2.508	0.060	3.214	0.024
lh_G_oc_temp_lat_fusifor	0.836	0.435	0.498	0.684	1.233	0.299
lh_G_oc_temp_med_Lingual	1.597	0.205	0.917	0.433	1.227	0.301
lh_G_oc_temp_med_Parahip	6.723	0.001	4.737	0.003	4.422	0.005
lh_G_orbitals	3.150	0.045	4.293	0.006	5.171	0.002
lh_G_pariet_inf_Angular	5.501	0.005	4.472	0.005	5.397	0.001
lh_G_pariet_inf_Supramar	2.882	0.058	2.405	0.068	3.024	0.030

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lh_G_parietal_suprs	6.412	0.002	3.426	0.018	4.358	0.005
lh_G_postcentralrs	1.744	0.177	0.634	0.594	0.392	0.759
lh_G_precentralrs	2.700	0.069	1.778	0.152	1.920	0.127
lh_G_precuneusss	5.144	0.007	4.039	0.008	4.208	0.006
lh_G_rectuss	1.459	0.235	0.538	0.657	0.602	0.614
lh_G_subcallosals	0.164	0.848	0.147	0.931	0.491	0.689
lh_G_temp_sup_G_T_transv	3.153	0.045	0.470	0.703	0.497	0.684
lh_G_temp_sup_Laterals	3.245	0.041	2.483	0.062	2.210	0.088
lh_G_temp_sup_Plan_polar	2.249	0.108	1.260	0.289	1.616	0.187
lh_G_temp_sup_Plan_tempo	1.592	0.206	1.362	0.255	1.923	0.127
lh_G_temporal_infs	6.188	0.002	4.575	0.004	4.517	0.004
lh_G_temporal_middles	3.293	0.039	2.369	0.071	2.286	0.080
lh_Lat_Fis_ant_Horizont	1.272	0.282	0.994	0.397	1.038	0.377
lh_Lat_Fis_ant_Vertical	3.793	0.024	0.096	0.962	0.035	0.991
lh_Lat_Fis_posts	1.451	0.237	1.155	0.328	1.669	0.174
lh_Pole_occipitals	2.730	0.067	1.092	0.353	1.394	0.245
lh_Pole_temporals	0.294	0.745	1.123	0.341	0.934	0.425
lh_S_calcarines	0.350	0.705	0.421	0.738	0.873	0.456
lh_S_centralrs	3.417	0.034	2.375	0.071	2.104	0.101
lh_S_cingul_Marginaliss	3.961	0.020	0.879	0.453	1.252	0.292
lh_S_circular_insula_ant	3.275	0.040	2.192	0.090	3.547	0.015
lh_S_circular_insula_inf	2.357	0.097	1.717	0.164	1.349	0.259
lh_S_circular_insula_sup	3.362	0.036	2.177	0.092	2.705	0.046
lh_S_collat_transv_ants	0.636	0.530	1.567	0.198	2.811	0.040
lh_S_collat_transv_post	2.073	0.128	1.956	0.121	2.527	0.058
lh_S_front_infs	3.791	0.024	3.182	0.025	4.405	0.005
lh_S_front_middles	3.060	0.049	1.645	0.180	1.611	0.188
lh_S_front_suprs	3.098	0.047	1.714	0.165	2.221	0.086
lh_S_interm_prim_Jensen	0.464	0.629	0.427	0.734	0.921	0.431
lh_S_intrapariet_and_P_trans	3.493	0.032	1.098	0.351	1.522	0.210
lh_S_oc_middle_and_Lunatus	1.497	0.226	1.113	0.345	0.930	0.427
lh_S_oc_sup_and_transversal	9.511	0.000	2.826	0.039	2.807	0.040
lh_S_occipital_ants	4.900	0.008	0.732	0.534	1.192	0.314
lh_S_oc_temp_lats	1.321	0.269	2.783	0.042	1.814	0.145

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lh_S_oc_temp_med_and_Lingual	2.065	0.129	1.578	0.196	2.173	0.092
lh_S_orbital_laterals	0.820	0.442	1.500	0.215	1.889	0.132
lh_S_orbital_med_olfact	0.052	0.949	1.165	0.324	1.447	0.230
lh_S_orbital_H_Shapeds	0.969	0.381	2.347	0.074	3.070	0.029
lh_S_parieto_occipitals	4.195	0.016	4.105	0.007	5.228	0.002
lh_S_pericallosals	0.274	0.761	1.842	0.140	2.673	0.048
lh_S_postcentrals	3.076	0.048	1.228	0.300	1.037	0.377
lh_S_precentral_inf_part	1.775	0.172	1.413	0.240	1.675	0.173
lh_S_precentral_sup_part	1.405	0.248	1.080	0.358	1.336	0.264
lh_S_suborbitals	1.988	0.139	1.676	0.173	0.936	0.424
lh_S_subparietals	0.705	0.495	0.686	0.561	1.331	0.265
lh_S_temporal_infs	0.314	0.731	0.939	0.422	0.551	0.648
lh_S_temporal_supss	3.825	0.023	2.821	0.040	3.404	0.018
lh_S_temporal_transverse	4.311	0.015	1.306	0.273	1.197	0.312
rh_G_and_S_frontomargin	3.467	0.033	2.257	0.083	2.389	0.070
rh_G_and_S_occipital_inf	1.275	0.281	0.821	0.484	1.351	0.259
rh_G_and_S_paracentrals	3.151	0.045	1.845	0.140	2.708	0.046
rh_G_and_S_subcentrals	1.711	0.183	1.562	0.199	1.901	0.130
rh_G_and_S_transv_frontopol	2.223	0.111	1.386	0.248	0.872	0.456
rh_G_and_S_cingul_Ants	2.910	0.056	1.204	0.309	1.867	0.136
rh_G_and_S_cingul_Mid_Ant	2.980	0.053	1.667	0.175	1.734	0.161
rh_G_and_S_cingul_Mid_Post	7.767	0.001	4.801	0.003	5.761	0.001
rh_G_cingul_Post_dorsal	2.743	0.066	2.343	0.074	3.255	0.022
rh_G_cingul_Post_ventral	2.089	0.126	1.732	0.161	2.243	0.084
rh_G_cuneuss	1.788	0.170	0.590	0.622	1.007	0.391
rh_G_front_inf_Opercular	1.845	0.160	0.813	0.488	1.560	0.200
rh_G_front_inf_Orbitals	3.510	0.032	2.808	0.040	2.619	0.052
rh_G_front_inf_Triangul	3.541	0.031	4.331	0.005	3.664	0.013
rh_G_front_middles	5.277	0.006	3.740	0.012	5.370	0.001
rh_G_front_supss	3.999	0.020	2.427	0.066	3.839	0.010
rh_G_Ins_lg_and_S_cent_ins	2.420	0.091	1.997	0.115	2.711	0.046
rh_G_insular_shorts	0.606	0.547	0.661	0.577	2.724	0.045
rh_G_occipital_middles	5.076	0.007	3.458	0.017	3.147	0.026
rh_G_occipital_supss	1.546	0.215	0.852	0.467	1.141	0.333

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rh_G_oc_temp_lat_fusifor	6.477	0.002	3.631	0.014	3.719	0.012
rh_G_oc_temp_med_Lingual	3.190	0.043	1.381	0.249	1.418	0.238
rh_G_oc_temp_med_Parahip	2.363	0.096	1.685	0.171	2.190	0.090
rh_G_orbitals	7.944	0.000	5.010	0.002	5.086	0.002
rh_G_pariet_inf_Angular	2.330	0.100	2.005	0.114	3.422	0.018
rh_G_pariet_inf_Supramar	3.867	0.022	2.971	0.033	3.423	0.018
rh_G_parietal_supss	4.441	0.013	2.228	0.086	3.613	0.014
rh_G_postcentrals	1.127	0.326	0.324	0.808	0.274	0.844
rh_G_precentrals	1.673	0.190	0.922	0.431	1.682	0.172
rh_G_precuneuss	5.338	0.005	2.729	0.045	3.303	0.021
rh_G_rectuss	0.183	0.833	0.972	0.407	0.227	0.877
rh_G_subcallosals	0.088	0.915	0.149	0.930	0.578	0.630
rh_G_temp_sup_G_T_transv	2.341	0.099	1.891	0.132	1.917	0.128
rh_G_temp_sup_Laterals	2.556	0.080	1.644	0.180	1.655	0.178
rh_G_temp_sup_Plan_polar	0.050	0.951	0.971	0.407	0.376	0.770
rh_G_temp_sup_Plan_tempo	1.315	0.271	1.212	0.306	0.963	0.411
rh_G_temporal_infs	4.121	0.017	0.909	0.437	1.202	0.310
rh_G_temporal_middles	7.111	0.001	2.381	0.070	2.546	0.057
rh_Lat_Fis_ant_Horizont	0.750	0.474	2.313	0.077	1.556	0.201
rh_Lat_Fis_ant_Vertical	1.550	0.215	2.260	0.082	0.920	0.432
rh_Lat_Fis_posts	5.256	0.006	4.217	0.006	5.616	0.001
rh_Pole_occipitals	2.531	0.082	1.412	0.240	1.647	0.179
rh_Pole_temporals	4.075	0.018	3.344	0.020	3.399	0.019
rh_S_calcarines	2.725	0.068	1.367	0.254	1.642	0.181
rh_S_centrales	3.376	0.036	1.565	0.199	1.641	0.181
rh_S_cingul_Marginaliss	1.797	0.168	1.185	0.316	1.361	0.256
rh_S_circular_insula_ant	2.041	0.132	1.127	0.339	1.400	0.244
rh_S_circular_insula_inf	2.368	0.096	1.136	0.335	1.539	0.205
rh_S_circular_insula_sup	4.641	0.011	3.051	0.029	3.801	0.011
rh_S_collat_transv_ants	2.738	0.067	2.110	0.100	1.898	0.131
rh_S_collat_transv_post	4.871	0.008	3.775	0.011	3.580	0.015
rh_S_front_infs	4.247	0.015	2.534	0.058	4.049	0.008
rh_S_front_middles	4.978	0.008	2.088	0.103	3.008	0.031
rh_S_front_supss	4.761	0.009	1.719	0.164	2.419	0.067

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rh_S_interm_prim_Jensen	3.427	0.034	2.546	0.057	2.294	0.079
rh_S_intrapariet_and_P_trans	6.888	0.001	3.359	0.020	3.677	0.013
rh_S_oc_middle_and_Lunatus	2.037	0.133	1.388	0.247	1.828	0.143
rh_S_oc_sup_and_transversal	5.262	0.006	2.598	0.053	2.334	0.075
rh_S_occipital_ants	3.567	0.030	0.681	0.564	0.889	0.447
rh_S_oc_temp_lats	2.241	0.109	0.886	0.449	0.550	0.649
rh_S_oc_temp_med_and_Lingual	2.197	0.114	0.716	0.543	0.524	0.666
rh_S_orbital_laterals	4.774	0.009	2.855	0.038	2.373	0.071
rh_S_orbital_med_olfact	1.061	0.348	0.579	0.629	0.686	0.561
rh_S_orbital_H_Shapeds	3.153	0.045	2.257	0.083	1.941	0.124
rh_S_parieto_occipitals	4.515	0.012	1.923	0.127	1.815	0.145
rh_S_pericallosals	1.992	0.139	0.263	0.852	0.279	0.841
rh_S_postcentral	6.068	0.003	1.191	0.314	1.172	0.321
rh_S_precentral_inf_part	3.501	0.032	2.083	0.103	2.057	0.107
rh_S_precentral_sup_part	1.144	0.320	0.715	0.544	0.697	0.555
rh_S_suborbitals	0.327	0.722	0.389	0.761	0.339	0.797
rh_S_subparietals	0.311	0.733	0.316	0.814	0.717	0.543
rh_S_temporal_infs	2.780	0.064	1.645	0.180	0.716	0.543
rh_S_temporal_suprs	5.032	0.007	3.622	0.014	5.043	0.002
rh_S_temporal_transverse	0.762	0.468	0.764	0.515	0.926	0.429

Note. *p*-values < 0.05, marked in red; FDR *q*-values < 0.05, in bold font. The names of the brain regions can be referred to article entitled with “Automatically parcellating the human cerebral cortex. Fischl B, van der Kouwe A, Destrieux C, Halgren E, Ségonne F, Salat DH, Busa E, Seidman LJ, Goldstein J, Kennedy D, Caviness V, Makris N, Rosen B, Dale AM. *Cereb Cortex*. 2004 Jan;14(1):11-22. doi: 10.1093/cercor/bhg087.

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Appendix 1 to Chien YL, Chen YC, Chiu YN, et al. A translational exploration of the effects of *WNT2* variants on altered cortical structures in autism spectrum disorder. *J Psychiatry Neurosci* 2021. doi: 10.1503/jpn.210022

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Supplementary Table S10. Prediction of CTCF binding sites around rs6950765 and rs2896218 on CTCFBSDB 2.0 (<http://insulatordb.uthsc.edu/>)

Motif PWM	Motif Sequence	Input Sequence	Motif	Motif	Motif	Score
			Start	Length	Orientation	
			Name	Location		
EMBL_M1	CTTCCCCTTGTGGC	rs2896218	298	14	+	13.2208
EMBL_M1	TGCCCTCAGGAGCT	rs6950765	249	14	+	6.33047
EMBL_M2	GGAACATTCA	rs2896218	698	9	+	6.58899
EMBL_M2	GGAAGAGCA	rs6950765	966	9	+	9.41403
MIT_LM2	TAAGCTCCTGAGGGCAGGA	rs6950765	246	19	-	8.04677
MIT_LM7	CCCCAAGCAGCTGGCACAGT	rs2896218	965	20	-	9.03359
MIT_LM7	TGTGCAGTTGATGGATCTAT	rs6950765	328	20	-	7.60958
MIT_LM23	AAGCCACAAGGGGAAGCTTC	rs2896218	294	20	-	6.98193

Note. CTCF uses different combinations of its zinc fingers to recognize divergent DNA sequences. Recent studies have identified core motifs for CTCFBS sequences and the motifs are represented by position weight matrices (PWM). Altogether, six PWM derived to accommodate the divergence of CTCFBS sequences have been identified and included in the web tool^{1,2,3}. The EMBL_M1 and EMBL_M2 motifs were identified by Schmidt et al.¹; and the LM2, LM7, and LM23 motifs were identified by Xie et al.³ The web tool used the STORM program⁴ and each of the six PWM to report the single best hit in the query sequence. The PWM score corresponds to the log-odds of the observed sequence being generated by the motif versus being generated by the background. A large positive score suggests a good match, while a negative score indicates that the best match to the query sequence was worse than would be expected in a random sequence of the same length. Usually a short sequence with a PWM score >3.0 is a suggestive match.

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¹ Schmidt, D., et al. (2012) Waves of retrotransposon expansion remodel genome organization and CTCF binding in multiple mammalian lineages. *Cell*, 148, 335-348.

² Kim, T.H., et al. (2007) Analysis of the vertebrate insulator protein CTCF-binding sites in the human genome. *Cell*, 128, 1231-1245.

³ Xie, X., et al. (2007) Systematic discovery of regulatory motifs in conserved regions of the human genome, including thousands of CTCFinsulator sites. *Proc Natl Acad Sci U S A*, 104, 7145-7150.

⁴ Schones, D.E., et al.(2007) Statistical significance of cis-regulatory modules. *BMC Bioinformatics*, 8:19.